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ABSTRACT

This document contains ideas and information regarding using the Internet in the professional development of vocational education teachers. Presented first is basic information about what the Internet is and its value as a tool for professional development (including its role as a vehicle for accessing the ERIC database, taking online classes, and communicating with other educators and schools). The types of information available through the Internet are listed and the following major Internet features/systems are described: electronic mail, file transfer protocol, the Gopher interface, Telnet method of connecting to other computers while on the Internet, Usenet news groups, and the World Wide Web (WWW) graphical method of linking information. Explained next are procedures for getting on the Internet and locating addresses or networks on the Internet. The next several sections provide more detailed information regarding USENET groups, Gopher, and the WWW. Listed in the final section are 26 possible ways of using the Internet in vocational-technical education, including the following: sharing curricula, advertising job openings, disseminating school-to-work concepts, conducting online forums, connecting to employers, disseminating research and information, engaging in collaborative learning, publicizing new books/curricula, communicating with students, and publishing works from vocational students. Contains 16 references. (MN)

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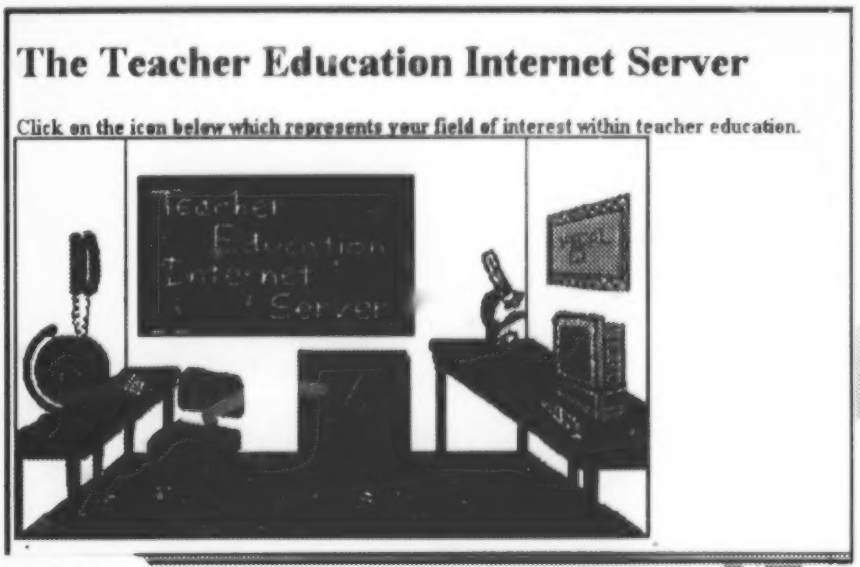
USING THE INTERNET IN PROFESSIONAL DEVELOPMENT

Presented at the

American Vocational Education Professional Development Association

American Vocational Association

Dallas - 1994


The Teacher Education Internet Server
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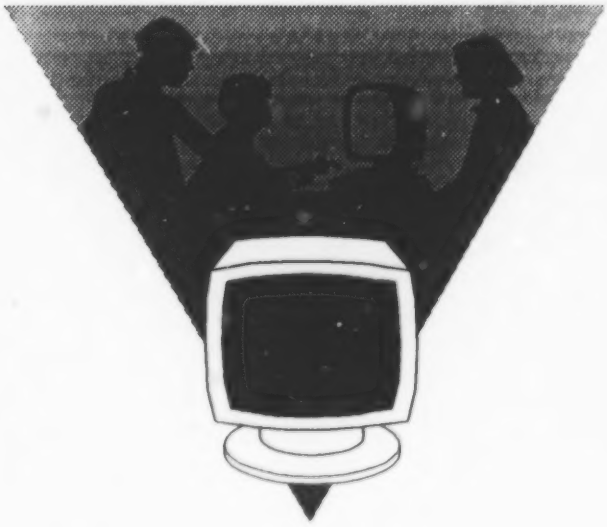
USING THE INTERNET IN PROFESSIONAL DEVELOPMENT: THE VIRTUAL CLASSROOM

by Dr. Alan and Sarah



WHAT IS THE INTERNET?

The world's largest computer *network*...actually it's a *network of networks,* all free to exchange information. *So what's the big deal?* The major accomplishment is that by using *common standards [TCP/IP or Internet Protocol],* existing networks can connect dissimilar software and hardware. Before the Internet, IBM equipment pretty much linked only to IBM, Digital Equipment Corporation systems connected easiest to other Digital computers, etc. The result of common connecting standards:

> Over 20,000 networks [as of 11/94] were in the Internet, with 1000 being added per month. At least a million machines [many individual networks consist of multiple machines] are

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connected along with 20 million people; and although it's the most *"open"* system in the world, over half of the network is commercial and not available to the general public.

Who actually owns the Internet and where is it located? There is really no owner--it is "owned" by the 15 million who use it daily and the organizations, both public and private that pay for the connection. It is *located* all over the world, including on the continent of Antarctica.

*And, contrary to what you might think, the Internet is **not free**.* Organizations, like universities, school systems, IBM, and Citicorp, all pay access costs. However, much information, particularly government and university-funded work, is openly accessible, once you are connected.

Internet? Electronic Superhighway? National Information Infrastructure?

Although the terminology can seem confusing, these terms are essentially all the same at this time. Some people envision a "superhighway" where all electronic information, including on-demand videos, electronic mail, banking, etc. will all be accessed through one system. The Internet, which is a collection of networks, IS the "electronic superhighway" of today. The National Information Infrastructure is essentially a blueprint put forth by the federal government with specific accommodations for research. However, the Internet would also be part of this plan. Whatever its called, a wide array of services and offerings are available currently, and it is growing at a breathtaking pace.

WHAT ARE THE OPPORTUNITIES IN PROFESSIONAL DEVELOPMENT?

The Internet offers an unprecedented tool for learners and learning. It is the ultimate "virtual classroom" that can be used anytime anywhere with minimal equipment. The only "gear" that is needed is a personal computer with a modem and a telephone line. For more complex connections, a local area network connection is required; and these are available today in many schools and offices. Users working on their own time, from almost any place, can have access to a cornucopia of sources, especially other people.. They can send a message directly to President Clinton or Vice President Gore [Gore is very computer literate and may answer himself!]. They can "step" directly into the gigantic Library of Congress, find health information at the Palo Alto Medical Center, ask technical questions about the new Autocad version 13, or Internet Newsgroups.

Communications, Communications, Communications

Although the Internet can link you to unlimited sources of information, the biggest asset is its ability to connect users to each other. Just like teachers are by far the biggest motivators in learning, the ability to communicate with other people is the greatest benefit of using the Internet. Certainly the largest communication needs might be within a local community, say between teachers and students needing more ideas on how to apply knowledge. But the ability to connect to other students, scholars, and information worldwide is remarkable. This brings tremendous empowerment to each individual. Additionally, every electronic address is a connotation of equality.

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Ask ERIC

Ask ERIC is a good example of using "simple" electronic mail to access research data and curriculum through personnel at "askERIC." Students or teachers can send questions to:

askeric@ericir.syr.edu

A trained researcher will peruse the vast ERIC database and send a reply within a maximum of 48 hours. The author has had students use this service with good results.

Online Classes

Access to online classes is already being offered and these will find widely increasing popularity. Classes are being offered for college students, K-12 students, and for workplace training.. The author took part in an experimental class entitled "Lets Go Gophern'" that was offered for free...and 17,000 people participated! This was not a class in the traditional sense; there was no credit offered, and very little interaction was available. However, it clearly demonstrated several points. First, this astounding number of participants were garnered not through mass marketing like television advertising, but simply through free postings on multiple networks. Secondly, it easily showed how eager people were to learn via this method. Thirdly, all enrollment was handled automatically, as were the electronic assignments. The school's "standard" computer system could send worldwide messages to 1,000 people within 5 minutes. Lastly, the "cost" to the university was very minimal, as only a handful of people were involved, and the messages were sent on a "space available" basis.

INTERNET AND SCHOOLS

Imagine schools where students could get turned on to a subject and instantly be zapping toward lessons from experts on the topic. Conferencing could occur between students, teachers, and businesses worldwide. Could this technology help improve skills and lead to a better-trained workforce, greater productivity, higher wages, lower rates of crime and poverty? The best education could be available anywhere, anytime.

Many K-12 schools, vocational schools, community colleges, and universities are using the Internet on a daily basis. The most frequent use is electronic mail, but searching for information is also common. Some school districts have their own "gopher," making their own networked information easily accessible to anybody on the Internet.

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The Future WILL Include Telecommunications

One of the most important aspects for educators to keep in mind is that the "electronic highway" is becoming THE pipeline for communications, recreation, and knowledge in the 20th century, and is destined for an ever-important role in the 21st century. Citizens need to know how to communicate, find and access constantly changing information, take courses, hold videoconferences, meet people of similar interests, and ?????? It is a simple fact that telecommunications will play an important role in everyone's life.

The benefits of students using the information superhighway have even been touted by Vice President Al Gore in *kid's+plus,* a syndicated supplement to Sunday newspapers (November 13, 1994). Moreover, he is pictured working online with two students at a computer. When asked what the information highway will mean to kids, Gore replied:

> *For young people, reaching the goal of universal service means that they will be limited only by their own imagination. No longer will geographic location, wealth, gender, or any other factor limit learning. One of my ideas for the information superhighway is that a child from my hometown of Carthage, Tennessee, will be able to come home from school, turn on a computer and plug into the Library of Congress in Washington, DC He or she will be able to find information on any topic form all over the world by browsing through vast digital libraries.*

> *Through the information superhighway, students also will be able to conduct scientific experiments on powerful supercomputers, learn about foreign languages and cultures by communicating with other young people around the world, and order new school clothes from their home computer.*

WHAT CAN YOU FIND ON THE INTERNET?

- Electronic mail with international capability, news groups, the Library of Congress, satellite weather pictures, a bookstore with 250,000 books, university libraries, the National Institute of Health, electronic journals, the Educational Resources Information Center, Shakespearean plays in "full-text," databases, computer software, and the use of highly specialized programs. *Eclectic? Absolutely. Useful? Absolutely.*

The Internet is a "work in progress," not a done deal. Recently, someone commented: *"It will empower you, break your heart, or make you on top of the world. It will change your life!"* You will hear the metaphor of the "Information Super Highway"--goes very fast; no has rest stops or tour guides. Some say it's a house where there are shared keys. Or that it's growing in all directions and no one is in charge. Whatever you hear or read, no one person is an Internet "expert" yet. *And what do you call somebody who can make efficient use of all this? An Internaut! And where do they do their work? In cyberspace!*

MAJOR SYSTEMS ON THE INTERNET

Unlike most "systems," the Internet does not have one "look" or a friendly "face." This is because it is a *network of independent networks.* And, in practice, this means that the software used by the Library of Congress is unlike that used by the University of Illinois' Weather Machine [it gives hourly satellite pictures]. And, the undirected, ever-changing nature of the Internet will never allow for a single user-friendly interface. However, many "front-ends," including graphical user interfaces [GUI's] are available for the common areas of the Internet. The "Gopher" is one such tool that has both commercial and shareware software available for use.

As a *network of networks,* the Internet has many avenues of connectivity. Electronic mail can be easily handled through virtually any type of service or dialup location. However, the most powerful aspects of the Internet are only available from a network that is *connected* through *client-server* software. This type of software is now available for both the Windows and Macintosh environment, while it had been confined to computers running UNIX programs. The newest software allows for client-server dialup connection to an Internet host, making the vast resources available from any location.

Major Internet features/systems:

Electronic mail - Arguably the most useful feature. One capability of Internet mail is joining ListServ "groups," which mail one item to thousands of people on various networks. *[There are many ListServ groups in education and vocational education, including VocNet and PerkAct]*

ftp - File transfer protocol, which allows free exchange of files with machines running the ftp protocol. *[relatively difficult without a Macintosh or Windows interface]*

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Gopher - A simple, menu-driven interface that allows navigating and finding sources with other gopher servers. *[items must be "linked" to a Gopher, and much of the net is not linked in this manner]*

Telnet - A method to connect to another computer and use it as if you were a terminal *on the system*. Many systems allow *anonymous* use, but information of a proprietary nature [say items from *Dow Jones* or *Time* magazine] would require payment.

USENET - Newsgroups on thousands of subjects, both serious and frivolous.

WWW - The World Wide Web is a graphical method of linking information, much like hypercard and hypertext, except that the information requested from a screen could be anywhere on the Internet, and in graphical, text, or audio format. Considered the "new wave."

These major features can be used both separately and in combination. For example, the Gopher menu can take you to a source that would be a telnet connection to a database. Also, Gopher will let you send files [commonly text files] to an email address.

HOW DO YOU "GET ON" THE INTERNET?

There are several levels of connections to the Internet. Everyone with Internet-capable electronic mail is "on" the Internet, and this includes over 20 million people worldwide. However, a "full" or direct connection would allow the use of relatively complex software that is on the "net," and this is generally available only to users on a Local Area Network. These users can then make use of software like Gopher and FTP [file transfer protocol]. Universities were some of the first organizations to see the value of being connected but now government [federal, state, and even local], and businesses are seeing the need.

Popular service providers like America Online and Delphi offer a user-friendly interface between the customer and the Internet. This means that users do not have full access but they can use simple and inexpensive communications software. Prices begin at about $10 per month.

Private individuals can gain direct Internet access by paying fees to an intermediary provider. This requires relatively complex software and an individual "IP" [Internet Protocol] address for each user. The connection can be completed through dialup modems and a SLIP [Serial Line Internet Protocol]. Prices for this level of service vary considerably, and often include a hookup fee plus charges of about $20/hour.

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LOCATING "ADDRESSES" OR NETWORKS ON THE INTERNET

IS THERE A COMPLETE DIRECTORY OF PARTICIPANTS ANYWHERE? No. ☹ However, some organizations do have searchable databases. Thus, if you are on CompuServe or America Online, you can easily search people on your own network. *So how do you find a username?*...Call them on the phone!?! Pretty low tech! Who said Internet was perfect? People are working on this limitation but a simple solution is not forthcoming.

By using Internet mail, you have the ability to send mail to millions of people. For example:

president@whitehouse.gov [Dear Socks:] or vice.president@whitehouse.gov

All messages you *receive* show the complete "address," which you can easily use to send a return message. Don't be surprised if the address has a lot of strange punctuation; *every* character must be included for it work; space and punctuate EXACTLY as you see the address on your screen. For example: seguina@columbia.dsu.edu [There is usually a last name/first initial at the beginning; the name of the "host" after the at sign "@"; "edu" signifies an Internet address at an educational institution, while CompuServe and America Online use "compuserve.com" and "aol.com." The suffix "com" is for a commercial network.

Virtually all of the "online systems," including Prodigy, CompuServe, America Online, Delphi, AT & T Mail, MCI, etc., have gateways allowing for Internet mail exchange. Thus, from an Internet account at an educational institution, a student or instructor can send and receive mail from many networks without being a paying member of those online systems.

Many "Letters to the Editor" portions of major magazines print their Internet address. *TIME* magazine uses the America Online Network, which has a connection to Internet mail. When *TIME* magazine began using the America Online system a few months ago, they were inundated with messages. It's never been easier for people to communicate nationally or internationally than now.

MAILING LISTS

Subscribing to a "mailing list" is probably the easiest way to get started "on" the Internet. *What is a mailing list?* It is a means of sharing information jointly to a group of people who share common interests. When you send one message, it automatically goes to everybody else on the list, which could mean hundreds of people. As you become more Internet literate, you will see announcements for either "ListServ" systems or special interest groups [SIG]. The Gopher and other tools will find "lists of lists," or lists within topic areas. However, these mailing lists are not "in" Gopher.

You can get yourself on a lot of these mailing lists, but be careful--you might end up with 400 new messages in your mailbox the next morning! Junk mail is still junk mail, even electronically. One

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reference book on the Internet describes more than 800 lists and suggests that this is a good place to start using Internet. To subscribe to a particular forum, the usual convention for being added to a mailing list is to send a message to *list-request@host*. Some lists may not provide this capability. After subscribing to a list, messages that are sent to the mailing list will appear directly in your electronic mailbox. Some mailing lists are unmoderated, allowing free-form discussion. These usually receive heavy traffic, and some of the messages may be "junk." Moderated lists are first read and then forwarded, resulting in longer turnaround time. It is important to "unsubscribe" to mailing lists you no longer wish to receive. Consult references sources for further information. In the tradition of computer science, things can get pretty complex and frustrating when looking for mailing lists to join.

Some Mailing Lists Related to Vocational Education:

AAAE	American Association for Agricultural Education
EDPOLYAN	Educational Policy Analysis Forum
STWNet	School to Work network
SIGTEL-L	Special Interests in Telecommunications
TCC-L	Community College Teachers
VOCNET	Vocational Education Network, sponsored by the National Center for Research in Vocational Education [approximately 800 subscribers]

USENET GROUPS

USENET is another method of sharing special topics. There are several thousand groups on virtually every topic imaginable, with titles like *comp.os.ms-windows.apps*. All groups are openly accessible but users need to have "newsreader" software, which normally resides on a computer network. "Trumpet" and "WinTrumpet" are commonly used packages that allow reading, downloading, and printing text messages. Users can select from both the groups and from the individual "postings." Readers can respond and post to the group or respond directly to the individual.

Some news groups related* to vocational education:

rec.autos.tech
comp.cad.autocad
alt.sewing
rec.food.cooking
rec.autos.antique
ke12.ed.business
misc.education.adult

**These do not include areas in disciplines well represented on the Net, i.e., medicine, engineering, computers, etc.*

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HERE COMES THE GOPHER

Despite all the hype, the Internet is very complex if the user does not have "friendly" tools or programs. And, although many programs have been written to make the Internet more user-friendly, the most popular program is called "Gopher." It is used by over one thousand sites worldwide.

- *Gopher?* A large rodent; the official mascot of the University of Minnesota. This communications program was originated at UMN--a gopher tunnels underground and out of sight, much as this information retrieval program does. The gopher's an industrious little animal, always busy scurrying about on behalf of its family. It's also a pun-- *go fer* because Gopher goes *fer* your files.

GOPHER is easy to use and can be used by beginners or experienced users. It helps us retrieve information from machines on the Internet that also have Gopher software. It uses a friendly, menu-based interface, called a *gopher client*. Much of the complicated part of other types of networks is eliminated by using a gopher program. There is a certain amount of wandering from menu to menu that you will need to do, but you will get to useful information fairly quickly. Some of the menu items are files that Gopher can display, mail to you, or copy to your computer. The Internet Gopher combines features of electronic bulletin boards and databases into an information distribution system that allows you to either browse or search through information as diverse as: library databases, recipes, phone books, news, weather, travel information, etc.

Gopher users can point the arrow keys to "burrow" deeper into the net. This is usually the fastest, easiest, and most fun way to wander around the Internet looking for and frequently finding the information you need. Use can be very slow during peak hrs.

When you enter the "main menu" of a text-based gopher it will look like this:

```
                Internet Gopher Information Client v1.11

                   Root gopher server: gopher.tc.umn.edu
--> 1.  Information About Gopher/
    2.  Computer Information/
    3.  Discussion Groups/
    4.  Fun & Games/
    5.  Internet file server (ftp) sites/
    6.  Libraries/
    7.  News/
    8.  Other Gopher and Information Servers/
    9.  Phone Books/
    10. Search Gopher Titles at the University of Minnesota <?>
    11. Search lots of places at the University of Minnesota <?>
    12. University of Minnesota Campus Information/

Press ? for Help, q to Quit, u to go up a menu                Page: 1/1
```

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All Gopher servers have the capability of connecting to "Search Other Gopher Servers" or similar wording, thus allowing access to other Gopher servers. If we select "8" "Other Gopher and Information Servers/" and from a menu not shown here, select "All," the user will access the screen below:

```
Internet Gopher Information Client v2.0.16

                All the Gopher Servers in the World

--> 1. Search Gopherspace using Veronica/
    2. 187resist: Immigrant Rights in California/
    3. 1994 California Voter Information/
    4. AACRAO National Office, Washington, DC/
    5. AARNET/
    6. AATF - American Association of Teachers of French/
    7. ACADEME THIS WEEK (Chronicle of Higher Education)/
    8. ACE GOPHER (American Council on Education)/
    9. ACES - Educational Service Agency Gopher/
    10. ACLU Free Reading Room/
    11. ACM SIGDA/
    12. ACM SIGGRAPH/
    13. ACTLab (UT Austin, RTF Dept)/
    14. AJCU Gopher  (Jesuit Mission and Identity)/
    15. ALADDIN Gopher/
    16. ALLDATA Corporation (car recall and technical service bulletins)/
    17. AMERICASNET/
    18. AMI -- A Friendly Public Interface/

Press ? for Help, q to Quit, u to go up a menu          Page: 1/124
```

This supplies an alphabetical list from the entire world! Note also that the lower right hand corner shows that this screen is *Page: 1 of 124 total screens, or 2227 [as of 12-94] Gophers!* The Gopher is an outstanding tool to begin exploring the Internet. As you begin to use the Gopher, you'll notice that there isn't a great deal of consistency from one menu to another. It can take some experimenting and poking around to figure out where people have hidden things; but invariably it's worth the effort.

Gopher is a lot harder to talk or read about than to use. So play with it--you may make some mistakes, but that's part of learning. It's difficult to give a better sense of how Gopher is organized, due to the way it has been developed. Gopher also has its own search tool, called *Veronica [very easy rodent-oriented net-wide index to computerized archives].* Veronica has a big database of available services. It tracks all the Gopher menus that can be accessed or indirectly from the mother Gopher in Minnesota. Veronica is just another search tool and you can find it under "other Gophers." Just as you browse through the stacks in a library, seeing what looks interesting, you will need to do the same with Gopher--there's no substitute for exploring. Soon you'll find where the "good stuff" is. And you'll probably find some useful services that you didn't know existed.

MOSAIC & THE WORLD WIDE WEB

A relatively new system called the "World Wide Web" (WWW) was developed in 1989 in Europe. Although it was initially designed for local use, its practicality was recognized immediately, and by late 1994 it has been implemented at over a thousand sites. It is called the "killer application" for the Internet as it brings a totally Graphic User Interface (GUI) to worldwide "networking." The "Web" allows the integration of graphics, text of varying sizes and typefaces, animation, and even sound. And, it does this on a "page" that allows direct access by icon or highlighted text that can "link" to other worldwide sites, hence the name "web." Further, it does this all in full color, with a user-friendly "point and click" graphic interface!

Mosaic is the name of the most popular software that will "browse" the web. The name "Mosaic" has become synonymous with the "web," although there are several other "web browsers" available. Mosaic One reason both Mosaic and the Word Wide Web software itself became so very popular so rapidly is because both of these relatively complex packages were available free on the Internet. Mosaic was developed by a federally funded programmer at the National Center for Supercomputing in Illinois. The center placed the program onto a computer that was readily accessible by others on the Internet, and within a very short time it was in use by thousands of schools and individuals.

The Web developed the URL, the Universal Resource Locator. This is the location of an Internet site. A WWW site will begin with "http," which stands for "HyperText Transfer Protocol." The "hypertext" layout allows Mosaic to access virtually any site or file on the Internet. Thus, it can access gopher sites, allow the sending of electronic mail, show a short video, or present the sound of an engine failing due to lack of oil.. Although a typical WWW user would begin entrance to the net with a "home page" of a web site, the program will also allow the user to begin access with other Internet systems, including ftp, gopher, usenet news, and telnet. Typical URL's would be "gopher://gopher.ed.gov" and "ftp://ftp.cica.indiana.edu." These precise locations can get quite lengthy, for example, "http://galaxy.einet.net/EINet/MacWeb/MacWebHome.ht."

There are several WWW sites specifically oriented to education. The "Dewey Web" from the University of Michigan is at "http://ics.soe.umich.edu/." The following web site is located at URL (URL's are case sensitive):

http://curry.edschool.Virginia.EDU:80/teis/

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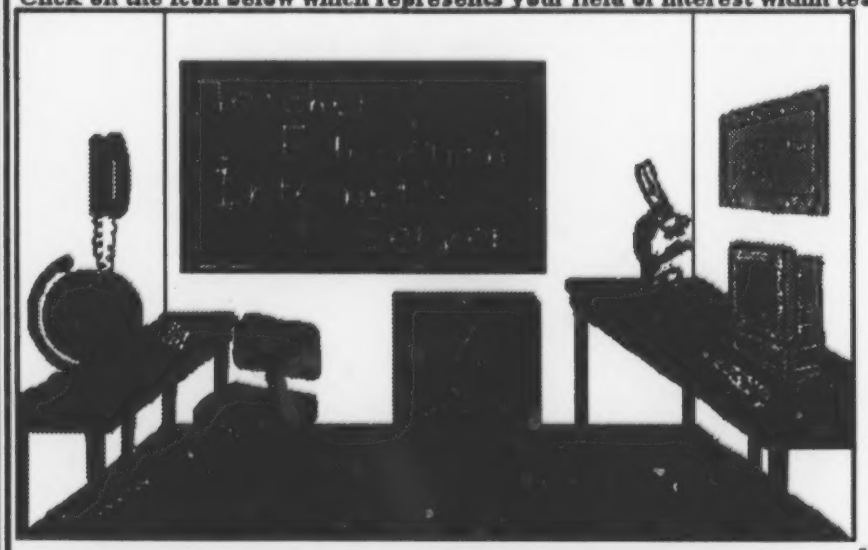
The Teacher Education Internet Server

Click on the icon below which represents your field of interest within teacher education.



The Society for Technology and Teacher Education (STATE), the University of Virginia, and the University of Houston have collaborated to establish a Teacher Education Server on the Internet. The Teacher Education Internet Server was established to explore the ways in which the Internet could benefit teacher education programs around the world.

TEIS Curator, Bernard Robin

If you are not able to use the graphic above to link to sections of the Teacher Education Internet Server, use the list below.

- **The Whole TEIS Gopher**
- **Special Ed**
- **Math Education**
- **Reading and Language Arts**

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The user simply "points and clicks" where they want additional information. In the top picture (which arrived on this author's screen in full color), activating the microscope with the mouse will will bring up science related data, clicking on the telephone brings up telecommunications information, and so forth. Highlighted, colored text is another means to "hyperlink" the user with related information. Thus, this type of interface to the Internet is as user-friendly as computers can get.

THE "DREAMNET" FOR VOCATIONAL EDUCATION

"Imagination is the window to tomorrow"

How could the field of vocational-technical education be using the Internet in the years ahead? The ideas compiled here are already possible with current technology. Also, many of the concepts are used in one form or another in different disciplines. An attempt was made to note sources known to the author. Hopefully, it will stimulate additional ideas that will come to fruition.

Some Possibilities:

Sharing of Curriculum
Job Openings *The Chronicle of Higher Education* has "**Jobs in Academe**" - **Texas Employment Commission** has computerized access
Database of Federal/State Laws and means for Questions
School to Work Concepts **STWNet** is available through a listserv
Resume Bank of Teachers/Experts
Online Forums with national experts, e.g. autocad, nursing techniques
Cooperative Learning with other students
Direct Instruction/Supplemental Instruction/Communications Specific courses are being offered and several universities offer degree programs
Funding Sources The **Department of Education** has listings
Browsing/Ordering Equipment and Supplies
Dissemination of Formal and Informal Research and Information **ERIC** and thousands of other sources are available
Emphasis for Rural Schools
At Risk Student Forum **ATRISK** Forum
Guidance Counselors
Career Counseling
Occupational Outlook Handbook It is currently available
Connections to Employers
Publishing your own Book This is being done in several disciplines
Special Needs Learner Forum There are forums on **Special Education**
Specific Technical Information Considerable information in the fields of **engineering, health, medicine (including nursing) science**
Collaborative Learning

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Calendar of Events in Vocational-Technical Education **Department of Education** has a calendar
New Books/Curriculum There are several **bookstores** on the net
Communications with Prospective, Current,and Former Students
Accessing Vocational Education magazines, called "e-zines" There are many already online
Publishing works from Vocational Students

FOR MORE INFORMATION

Magazines

Classroom Connect, Wentworth Worldwide Media *[Magazine, for info via Internet: connect@wentworth.com]*
Info to Go!, Info to Go, PO Box 272,Garden Grove, CA *[Magazine]*
Internet World Magazine. Meckler Corporation. *[Magazine meckler@jvnc.net]*
NetGuide, CMP Publications, Manhasset, NY *[Magazine mail@netguide.cmp.com]*
Online Access, Chicago, IL. [Magazine]

Books

Beckner, Weldon, and Barker, Bruce O. *Technology in Rural Education*, Phi Delta Kappa Fastback, 1994.
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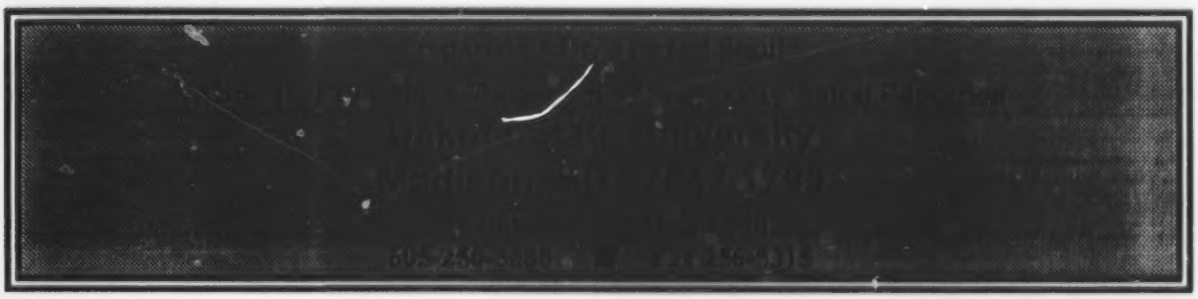

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